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# IMPORTANT COMMUNICATION LINES AND CITIES[20]

489 In the region of East China the main north-south lines of communication are the Tientsin--P'u-k'ou Railway, the Grand Canal, and a few major highways. Crossing these lines at a right angle are the Chiao-chi (Tsingtao-Tsinan), Lunghai, and Nanking-Shanghai railways and the Yangtze River, which in this region is navigable all year round.

Tsinan (1), the capital of Shantung Province, is the rail and highway hub in northwest Shantung. The city thrives on rapidly expanding light industries and is in a strategic position because the Tientsin--P'u-k'ou Railway bridge spanning the Yellow River is immediately to the north. Tsinan is linked with the Shantung Peninsula by the Chiao-chi Railway, which
• 288 terminates at the port of Tsingtao . Tsingtao owes its early development to foreign effort, and it is the largest textile industrial center in this province. It is in the new No. 6 National

20. Chung-hua Jen-min Kung-ho-kuo Fen-sheng Ti-t'u, op. cit.; Ch'eng Kuang-Yü, Chung-kuo Tu-shih [The Cities of China], Taipei, Chung-hua wen-hua ch'u-pan shih-yeh wei-yüan-hui, 1953.

•288 Textile Factory at Tsingtao that a woman worker, Ho Chien-hsiu, developed her accelerated method of work which won her international recognition (at least among the Soviet nations) as a "labor heroine." A convalescent hospital and rest camp for "model laborers" has been established at the famous beach resort.

489 The port of Tsingtao, whose extensive rail spurlines connect the wharf with nearby warehouses, has a breakwater over 1,300 feet in length.

The Tientsin-P'u-k'ou Railway passes Tsinan, Tzu-yang , and Hsü-chou . Hsü-chou is in Kiangsu Province and has been the locale of many decisive battles in ancient and modern Chinese history. The Lunghai Railway links Hsü-chou with Lien-yün-kang on the coast. Lien-yün-kang, with a wharf of about 1,000 feet in length, is not an extensive port.

There is no north-to-south railway in Kiangsu Province, but the highway net is a complete one. The Grand Canal connects many eastern Kiangsu cities with Yang-chou ,
[317] formerly a noted resort. Besides luxury and comfort, Yang-chou also offers a large supply of salt produced in the lower Hwai River area.

489 In southeast Kiangsu the communication
361 center is, of course, Shanghai. This city, the largest in the Far East, must rely on the

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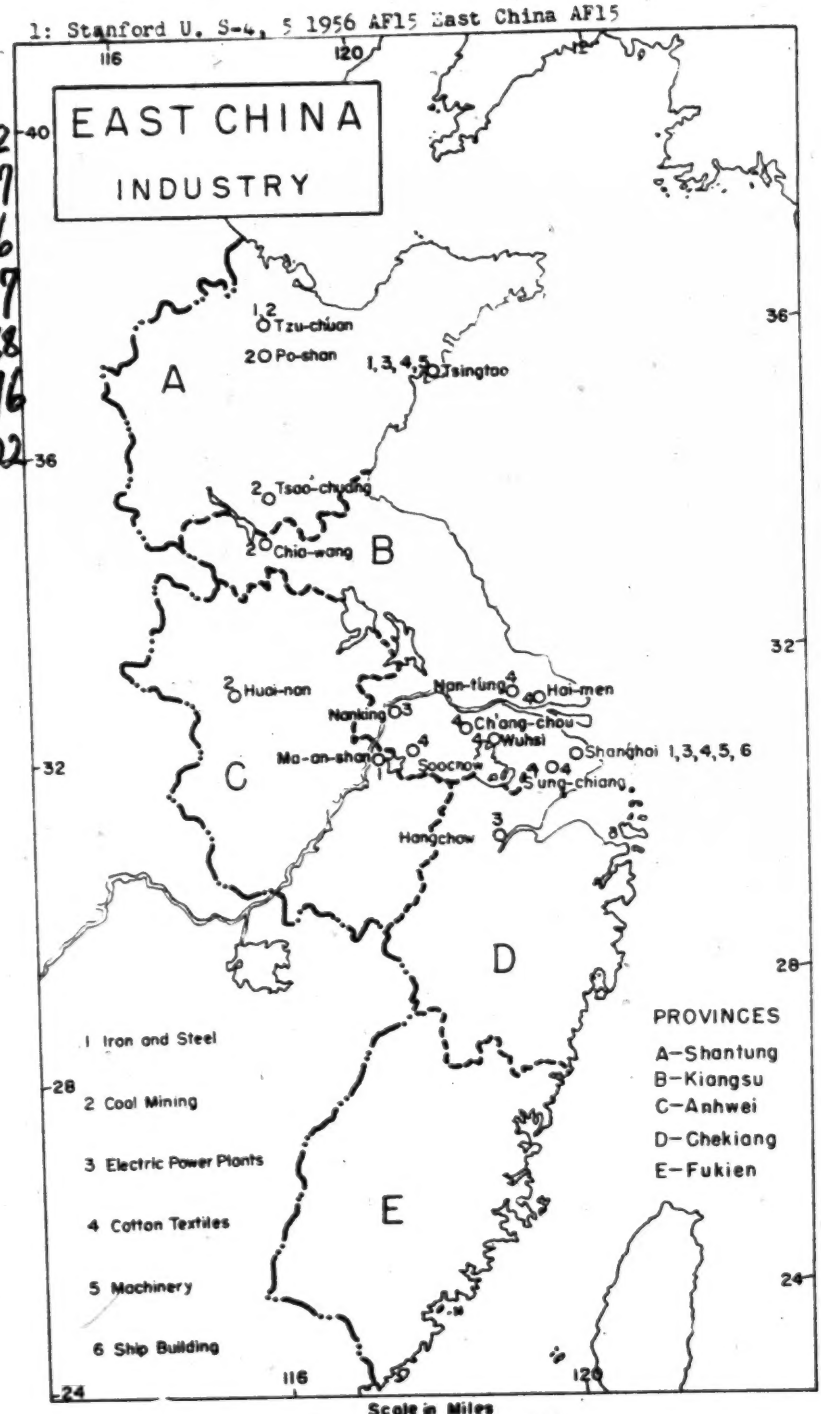


[Face p. 769(a)]

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327 There are two principal steel works in
433 East China, the Shanghai Iron and Steel Works and the Hsin-ho Iron and Steel Works, both located in Shanghai. The former is equipped with two 10-ton open-hearth furnaces and has an annual capacity of about 12,400 tons of ingots and 50,000 tons of rolled steel products. The Hsin-ho works is equipped with two 10-ton open-hearth furnaces and has an annual capacity of 16,500 tons of ingots, 30,000 tons of rolled steel, and 20,000 tons of steel wire.[24]

All in all, however, the iron and steel industry of East China is relatively little developed. This situation is understandable in view of the lack of iron and coal resources in the region.

D. Cotton Textiles

288 Contrary to its backwardness in the
433 production of iron and steel, East China is the most highly developed area in China for the manufacture of consumer products, as we have indicated. In particular, the cotton

24. Chung-kuo Kung-yeh [China's Industry], Peking, April 20, 1950, Vol. I, No. 12, pp. 21-22.

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288 433 textile industry stands out as the most significant achievement in the country's development of modern manufacturing.

The total cotton spindleage in China in 1937 was 5,635,006, of which 51.8 per cent were owned by Chinese interests, 44.1 per cent by the Japanese, and 4.1 per cent by the British.[25] After the war, all the Japanese cotton textile mills, mostly located in Shanghai and Tsingtao, were confiscated by the Nationalist Government and incorporated into a large state firm known as the China Textile Corporation. In 1949, East China possessed a total of 3,474,694 cotton spindles, which constituted 80 per cent of the total in China.[26] In 1953, the number dropped to 3,274,694, representing a 6 per cent decrease as compared with 1949.[27] As regards the geographical distribution of cotton spindles in East China in 1953, Kiangsu constituted 85 per cent, of which Shanghai again accounted for about 78 per cent. In addition to the mills in Shanghai, there were, in 1951, 53 private cotton mills in South Kiangsu with a total of 520,000 spindles.

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25. Plan for the Industrial Development of China, Nanking, March 1948.

26. Tung-pei Jih-pao [Northeast Daily], Mukden, April 18, 1949; Hsin-wen Jih-pao [Hsin-wen Daily], Shanghai, March 5, 1951.

27. Wen-hui Daily, Hong Kong, May 19, 1953; June 8, 1953; July 2, 1953; Aug. 9 and 14, 1953, September 5, 1953, Nov. 1, 1953; Kwang-ming Jih-pao [Enlightenment Daily], Peking, Aug. 6, 1953.

288 Of these, 246,000 spindles were in Wu-hsi
433 and 274,00 in Ch'ang-chou, Soochow, and S'ung-chiang.[28] In North Kiangsu, most of the mills are centered around Nan-t'ung and Hai-men, with a total of 179,632 spindles in 1950.[29] Another important cotton textile industrial center in East China is Tsingtao, Shantung Province, where there were about 350,000 spindles in 1953, constituting nearly 11 per cent of the spindles in the whole region.[30]

The total number of machine looms in China was estimated to be 67,900 at the time of the Communist occupation of the Chinese Mainland in 1949.[31] According to comparatively recent information, the total number of looms in Shanghai and Tsingtao amounted to 46,000 and 4,800 respectively[32] in 1953.

Regarding the output of cotton yarn, East China produced 1,256,000 bales in 1949,

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28. Survey of China Mainland Press, Hong Kong, U. S. Consulate General, May 11 to 15, 1951, No. 104, p. 50.

29. Economic Weekly, Shanghai, March 16, 1950, No. 11, p. 14.

30. Atlas of the People's Republic of China by Provinces, Shanghai, 1953, p. 32.

31. Yuan-li Wu, op. cit., p. 307.

32. Wen-hui Daily, June 22, 1955, pp. 32-33.

288 433 constituting 70 per cent of the total production of the whole country. In 1953, the output reached 25,561,770 bales,[33] more than double the 1949 output, but only about 65 per cent of the country's total production in that year.[34] East China again takes the lead in the production of cotton cloth. Though complete data are lacking, considerable growth has been reported under the Communist regime. If we take the production of 1947 as 100, it increased to 133 in 1950 and to 157 in 1951.[35]

288 433 475 Considerable progress has been made in the development of textile machinery plants since 1950. There are, at present (1955), seven plants for manufacturing textile machinery in China, of which five are state-owned and two are joint state-private enterprises. In East China, the Shanghai No. 2 Textile Machinery Works is state-owned and the China Textile Machinery Works and the Far Eastern Card Clothing Manufacturing Plant, both located in Shanghai, are joint

33. 400 pounds each.

34. Economic Weekly, Shanghai, Feb. 26, 1953, pp. 16-18; Chinese Industry, Peking, Jan. 1950, p. 37; Wen-hui Daily, Hong Kong, Oct. 1 and 6, 1953.

35. Survey of China Mainland Press, Hong Kong, U. S. Consulate General, No. 220, p. 30.

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288 state-private industries.[36] Data on the
433 textile-machinery production of East China
475 are not available, but the total production of the seven plants during 1951-53 was reported to be 600,000 spindles and 18,500 automatic looms, with which 9 state-owned cotton textile mills have been equipped.[37]

## V. CONCLUSION

178 Although East China remains a vitally important part of Communist China's industrial life and will be expected to supply both capital and consumer goods to a large segment of the country's population during the Five-Year Plan, it is no longer scheduled for intensive development in the future. There may be exceptions to this general statement, particularly in certain parts of Shantung, and possibly also in Fukien, once railway construction has established an effective overland route between Amoy and the Chekiang-Kiangsi Railway. However, on the whole, it may be said that East China's heyday in Chinese industry is over. The statement is especially true in the case of Shanghai.

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36. New China News Agency, Peking, Nov. 1, 1954.

37. Hsin-hua Yüeh-pao [New China Monthly], Peking, Feb. 1954, No. 2, pp. 169-70.

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foreign community. It was only after 1900, when the Japanese became one of the leading groups in the foreign community, that the proportion of foreign women reached even a third.

The Japanese are Shanghai's nearest foreign neighbors, and with their industrial experience and their drive for economic expansion overseas, they made Shanghai one of their most important industrial centers, especially for the manufacture of cotton textiles, taking advantage of relatively cheap Chinese labor, locally grown cotton, and cheap power to produce for the China market inside the low tariff wall. The Treaty of Shiminoseki in 1895, which ended the war of 1894–5 between China and Japan over Korea, first granted to foreigners the right to establish factories in the treaty ports of China, and this originally Japanese privilege was then taken advantage of by all the other powers having most-favored-nation treaty agreements with China.

Despite foreign investments, however, Shanghai remained a Chinese city, still politically dominated by the handful of foreigners, but economically more and more maintained by the Chinese, as native industrial and commercial capital and management were increasingly added to native labor in the growing industry of the city during the twentieth century.*

### *Shanghai and China*

Throughout the period 1843–1937, the foreigners at Shanghai pressed the Chinese authorities for an extension of their own administrative powers and of the area of the two foreign settlements. In this endeavour they found lukewarm support or outright opposition from the foreign diplomatic representatives at Peking and from the foreign offices in the home countries, who shied away from the implications of full sovereignty over Chinese territory and who continually reminded the overzealous foreigners in Shanghai of their precarious and equivocal legal position in asserting "rights" of taxation, defense, and administrative independence. The complex political and economic structure of modern Shanghai was erected primarily on the precedents resulting from bluff, maneuver, and *force majeure* of the assertive foreign residents of the city.

* A majority of the city's industrial enterprises were Chinese-owned by at least 1920.

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"China" silk area for foreign trade was marketed in Shanghai, through both Chinese and foreign trading firms, who sold it for export. Steam filatures for the reeling and spinning of silk had largely replaced domestic reeling and spinning by 1920, but this did not affect the concentration of silk marketing in Shanghai, since the reeling centers remained tributary to Shanghai and since the silk-reeling industry was also concentrated, in differing degrees at different periods, in the city.

After the introduction of cotton from India in the Yüan dynasty (1260–1368) and the manufacture of cotton cloth in China on a large scale by the end of the Yüan, this much cheaper fabric largely displaced silk, which previously had been produced in almost every region of China and was universally worn. The quality of the silk also declined. By the end of the eighteenth century only the four major areas listed above were important silk producers, but the great increase in China's foreign trade, especially in tea and silk, which followed the opening of the treaty ports stimulated both the quantity and quality of silk production in these areas, most of all in the chief silk region of the Yangtze delta, where foreign traders were closest on the scene.

The leading silk areas within the delta coincide closely with the areas where navigable waterways are most numerous. The upland districts south of Nanking and west of Tai Lake, where waterways are relatively sparse, are largely avoided by silk culture. This is mainly due to the fact that silk culture is a painstaking and time-consuming process which requires prodigious amounts of hand labor. It is therefore heaviest in lowland areas with a dense population, as is the case with nearly all of the silk producing regions of China, but such a location facilitates a virtually exclusive dependence on water transport for marketing the silk. This in turn tends to make Shanghai, as the primate commercial center of the delta, the dominant market for silk exports, since it can draw silk from the producing areas by water transport nearly as easily and cheaply as can inland centers.

Every important cocoon and filature center in the delta has multiple water connections and depends on them for the collection of cocoons and for the marketing of silk. Liu Ta-chün in his study of

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Textile manufacturing was by far the leading industry in Shanghai in the period 1920–36, and included the spinning, weaving, and dyeing of cotton, wool, jute, flax, hemp, and ramie, and the spinning and weaving of silk. The pattern of manufacturing was in most respects typical of the early stages of industrial development, with textiles far in the lead and light consumer goods in general predominant. Shanghai, however, as the primary focus of the Westernization process in China in which a pre-industrial economy was suddenly confronted with the impact of a highly developed industrial economy, was also engaged to some extent in the production of capital goods to supply its own consumers'-goods production and that of most of the rest of China.

For the city as a whole in 1932–33, Liu estimated[4] that the textile industry accounted for 50 to 60 per cent of Shanghai's industrial workers and 40 to 50 per cent of the value of industrial output. Cotton spinning led the textile industries, followed by silk reeling, cotton weaving, wool spinning, and wool weaving in that order. Food industries were second, with 10 to 15 per cent of the industrial workers and 30 to 35 per cent of the value of industrial output. Flour milling was first in this category, closely followed by tobacco (cigarette manufacturing). Most of the rice entering Shanghai was milled in the hinterland collection centers and all of the relatively few rice mills in the city employed fewer than 30 workers.

Clothing industries ranked third, with 3 to 5 per cent of the value of the industrial output, leather and rubber goods fourth, with 2 to 3 per cent, paper and printing fifth, chemical industries sixth (including matches, soap, cosmetics, drugs, and production of industrial chemicals), and manufacture of machinery seventh.*

The Shanghai Municipal Council in its Report for 1935 published figures showing the distribution of factories and workers within the various industries located in the International Settlement, based on surveys conducted in 1934 and corrected to November 1935. In

* These figures for 1932–33 are representative for the period 1920–1936 despite the world depression, which affected Shanghai manufacturing relatively little and whose effect in Shanghai was delayed until late 1933 in most industries, with the exception of silk reeling and weaving, which were heavily dependent on the American market. See Liu Ta-chün, *The Growth and Industrialization of Shanghai* (1936).

348 area. Kiangsu alone produced before the war about 30 per cent of
439 China's total annual cotton crop. Shanghai's textile mills at this period consumed an annual average of about 3,800,000 piculs of raw cotton (one picul equals 133 pounds), of which it is estimated that 2,000,000 came from Kiangsu, 500,000 from Hankow, 500,000 from Tientsin by sea, and 800,000 from foreign ports, principally from the United States.[11] The foreign cotton imports were predominantly of long-staple varieties for the weaving of finer-count cloth for which the native short-staple Chinese cotton was not suitable. During the 1930's considerable progress was made in growing long-staple cotton in China from American seeds, including that grown in the Kiangsu area, so that by 1936 foreign cotton imports to Shanghai were only half of what they had been in 1920.[12] The ground thus gained was largely lost during the war years, but reports from China since 1946 indicate that self-sufficiency in all types of cotton is now again within reach, with Kiangsu still the leading producer.[13]

231 The major silk-producing regions of China are also near at hand.
288 The delta areas of Kiangsu and Chekiang accounted for about half of the total Chinese production of raw silk in the 1920's and 1930's, as they had during most of the nineteenth century, and Shanghai remained the primary silk market of China. When silk-reeling, spinning, and weaving in the delta area became largely concentrated in factories after about 1910, rather than being done as before on a domestic basis, it was logical that the industry should center in Shanghai, as well as in the nearby cities of Soochow, Wusih, and Hangchow.

231 The rest of the textile industry is less closely related to the sources
248 of its raw materials. About three-quarters of the raw wool used in
288 Shanghai factories before the war came from the grazing areas of northwest China via Tientsin, by sea and rail. Less than one-tenth came from Kiangsu, and it was mainly "dead" wool of poor quality shorn from dead sheep and goats. The remainder was supplied largely from central China, via Hankow, by Yangtze steamer.[14] Ramie and hemp for Shanghai manufacturing came primarily from Hankow, in the center of the chief producing areas
[439] for both crops. Most of the jute consumed in Shanghai was imported from India.

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proportionate costs of labor and power. The same comment applies to the high figure for machinery.

In a generally more careful work dealing only with the cotton industry, Fong Hsien-ting, as shown in the accompanying table, provides a different estimate of costs in the production of cotton yarn in Shanghai in 1930.[37]

| *Cost Item* | *Percentage of Total Costs* |
|---|---|
| raw cotton | 42 |
| labor | 30 |
| power | 8 |
| overhead and interest | 20 |
| | 100 |

These seem much more reasonable, and they are generally substantiated by the findings of Moser and of Pearse.[38] Liu's figures for cotton spinning are also suspect because in 1934 a larger proportion of the mills' supply was the cheaper domestic cotton (see above, p. 172). If we may accept these figures of Fong's as a closer approximation to the facts than Liu's, we have at least some idea of the proportionate cost of delivered raw materials in Shanghai's largest industry, cotton spinning, and we may justifiably assume that this cost was of approximately the same order of magnitude in the other cotton industries and in the silk industries, since Liu's figures show a maximum spread of only 10 per cent among the raw materials' cost in the textile industries which he covers, and since both cotton and silk supplies came very largely from the local delta area. We have unfortunately no check on Liu's estimates of raw materials' costs in other leading Shanghai industries. Since with the exception of flour milling and machinery, these other figures seem reasonable, we can only accept them with caution.

Even after this revision, however, the best estimate which can be made of the proportionate costs of raw materials in Shanghai manufacturing still shows these costs to be high by Western standards.* There are two major reasons for this: the relatively low cost of labor, and the relatively high cost of transport. The first

*The United States Census of Manufactures for 1939 gives value figures for manufacturing costs in major categories of manufacturing in the United States in

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489 large carriers. The city's water connections, however, are uniquely good. (They have been outlined in some detail in Chapters Four and Seven.) It may be assumed that the cost of most delivered raw materials in other Chinese industrial centers was a higher percentage of total costs of production than in Shanghai. This assumption is borne out in the case of Tientsin. Tientsin is not only an ocean port through its association with Taku, but it lies on the Grand Canal and is, after Peking, the second most important rail junction in China. It lies at the focus of an even more extensive lowland (the north China plain and the basin of the Yellow River) than does Shanghai. Tientsin's water connections over this lowland are slight compared with Shanghai's water connections over the Yangtze basin, but with the possible exception of Hankow, Tientsin nevertheless has the most favorable orientation to transport routes of any Chinese industrial center after Shanghai.

• 288 435 Fong Hsien-ting found, in comparing production costs in the spinning of cotton yarn (also Tientsin's largest industry by value of output) that the cost of delivered raw materials in this industry in Tientsin averaged about 70 per cent of the total cost of production, as against an average of 42 per cent for Shanghai (see above, p. 180). Yet Tientsin also lies near the center of one of China's leading cotton-producing areas, through which three railway lines run to the city. Fong's cost estimates for the Tientsin cotton yarn-spinning industry, by percentages of total costs, are shown in the accompanying table.[42]

| *Cost Item* | *Percentage of Total Costs* |
|---|---|
| raw cotton | 70 |
| labor | 15 |
| power | 7 |
| overhead and interest | 8 |
| | 100 |

It does not seem possible that the costs could be divided as Fong has estimated. The figure for raw cotton seems too high, and that for overhead and interest too low. Power is cheap in Tientsin, due largely to the proximity of the Kailan mines at Kaiping, 82 miles north by rail, China's largest producer of coal, and the chief source of Shanghai's coal supply as well. The figure for labor costs is of

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course depressed by the high figure for raw cotton. Nevertheless it seems clear that Tientsin, despite its rail and water connections and its location in a major cotton-producing area, paid a considerably higher price than Shanghai for delivered raw cotton. If this was true for raw cotton, we may assume that it was true for most of the other industrial raw materials consumed in Tientsin, with the obvious exceptions of coal and the wool, hides and skins of north China, and the possible exception of wheat.* If Tientsin could obtain the necessary raw materials in these latter cases more cheaply than Shanghai, this is further evidence of the paramountcy of the Shanghai market and of the market-oriented character of its manufacturing. If Tientsin paid a higher price than Shanghai for most delivered raw materials, we may assume that other Chinese industrial centers did so too.

Water transport has been a key factor in the development of manufacturing in Shanghai. The city's railway connections are inferior to Tientsin's, and yet its manufacturing apparently paid less for most of its raw materials, and in fact was a greater consumer than Tientsin manufacturing of the leading industrial raw materials of north China: coal, hides, and wheat, all of which can move to Shanghai by sea from north China ports. In turn, the primacy of the Shanghai market depends in large measure on the water transport network which includes half of China in the city's tributary area. The market is able to exercise its attractiveness for manufacturing of all kinds by its ability to draw to its generally resource-poor area by sea and river transport the industrial raw materials which it needs.

### *Coal and Electric Power*

The single most important industrial raw material, coal, has been left for final consideration, since it plays a major role in nearly every industry, directly, or in the form of electric power.

* Shanghai nevertheless led Tientsin in the 1920's and 1930's in the consumption of coal and in the production of leather goods and flour, and in fact shipped nearly 10 per cent of its total flour production to Tientsin on an annual average. (For comparative figures on consumption of coal and production of leather goods and flour, see respectively Leonard Ting, "The Coal Industry in China" (1937), p. 217; Chinese Year Book (1936), p. 1153; Y. C. Chang, "Flour Milling in China" (1922), p. 219).

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munist government) was by far the largest. An official of the company estimated that it was responsible for an average of 83 per cent of the total sales of electric power in Shanghai for the period 1925–1934, and that 78 per cent of its sales during this period were to industrial users, distributed as shown in the accompanying table.[55]

| *Industry* | *Percentage of Total Industrial Power Sales* |
|---|---|
| cotton mills | 78 |
| flour mills | 7 |
| rubber goods factories | 2 |
| miscellaneous textiles | 2 |
| other industries (less than 1 per cent each) | 11 |
| | 100 |

The city's dominant industry, cotton textiles, was thus apparently heavily dependent on rented electric power. All of the five power plants in Shanghai were entirely carbo-electric. The Shanghai Power Company operated two plants, one at the northeastern tip of Yangtzepoo (the "Riverside" plant), and the other near the mouth of Hongkew Creek (map 3). Of the other three plants, one was owned by the French Municipality and was located on Siccawei Creek at the southern edge of the French Settlement, and two were Chinese-owned, located respectively in Nantao and Chapei. The silk-reeling industry does not appear in the above table because it used primarily steam power (and steam heat), which was produced on the factory premises from coal. Approximately 80 per cent of the industrially-used electric power was purchased from the power companies, and only about 20 per cent was generated by the industrial consumers themselves. Fully half of this 20 per cent was accounted for by the generators of the Kiangnan Arsenal.[56]

Shanghai produced in 1936 58 per cent of the electric power generated in China, and the "Riverside" plant of the Shanghai Power Company had a larger output in 1930 (450 million kilowatt-hours) than any single station in England.[57] The combined output of all four power companies in 1930 was greater than in any English city except London.[58] This power was sold at very low rates, special rate arrangements being made for large industrial users.

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staple supplies from overseas. Tientsin, Hankow, and to a lesser extent Tsingtao, could, however, use this improved Shensi cotton, and by the early 1930's, although the production of long-staple cotton had spread into all the cotton-growing provinces, more of it was grown in Hopeh and Shantung than in Kiangsu.[63]

A further factor was China's recovery of tariff autonomy in 1929. Up to that time, the tariff on most imported and exported goods was fixed by successive treaties between China and the major Western powers (beginning with the supplement to the Treaty of Nanking in 1843) at 5 per cent *ad valorem*. In practice the rates had varied between 3 and 10 per cent, but the average between 1843 and 1929 had been close to 5 per cent.[64] The new tariff of 1929 promulgated by the Nationalist Government in that year and revised in 1931, 1934, and 1935 imposed duties on the import of raw cotton and cotton yarn which varied considerably but which averaged about 17 per cent *ad valorem* between 1929 and 1935.[65] While Shanghai normally drew about 20 per cent of its raw cotton from abroad, Tsingtao, Tientsin, and Hankow respectively drew 93, 95, and 98 per cent of their raw cotton supply from domestic sources by 1930.[66] The average price of raw cotton in Shanghai by 1935 was about 10 per cent higher than in these three other centers, and nearly 90 per cent of the new building in the cotton textile industry in that year was elsewhere than Shanghai, although Shanghai still contained 51 per cent of the cotton spindles in China in 1936, and although total production costs for cotton spinning were still about 10 per cent lower in Shanghai than in any other Chinese city.[67]

This may prove to have been only a temporary disadvantage, since in the face of higher duties on imported raw cotton after 1929, and currently of China's desperate attempts to become independent of foreign imports, steps have been taken to increase the production of long-staple cotton, especially in Kiangsu where Shanghai manufacturing is so heavily dependent on it. The work of the Cotton Industry Commission of the National Resources Commission during the 1930's indicates that the goal of complete self-sufficiency in all types of cotton was realizable within five or ten years, under an effective administration.[68] Recent reports from China suggest that domestic cotton production, while still inadequate to supply Shang-

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361 248 hai's textile factories, is now again approaching a self-sufficient level.[69]

Until 1927, the silk-reeling industry had been larger, by value of output, in Hangchow and in Wusih (where it was more closely oriented to the major silk-producing areas) than in Shanghai. With the stimulus of civil war in the delta in 1926, many of these mills moved to Shanghai, where they could get cheaper coal and electric power, abundant capital, and the general commercial advantages of a large market, as well as being able to draw their raw silk from the producing areas by water transport at nearly the same cost as in Hangchow or Wusih. By 1936, however, Wusih again led Shanghai in silk-reeling, due apparently to lower labor costs in Wusih, local skill, newer and hence more efficient plants, and the drop in the Wusih price of coal brought from Shanghai by barge trains pulled by steam tugs.[70]

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361 A major and continuing development of the 1930's was the large Japanese investment in Manchurian heavy industry, notably in the Mukden area. Following the Japanese conquest of north China in 1937–38, this development was extended to include the Peking-Tientsin area, although on a much smaller scale. While these were primarily strategic or military rather than economic investments, they laid the foundation for a new heavy manufacturing center, closely oriented to its sources of bulk raw materials, and confined to the north. In addition to the logical association with coal and iron deposits, this project was geographically an obvious one for Japan to undertake from her original Korean and Manchurian base, and it did not include Shanghai, especially after the widening of the war from 1941 on made seaborne imports of raw materials into Shanghai increasingly difficult.

Japanese war-dictated industrial investments have now however become a legacy of great value for China, and heavy manufacturing is still virtually restricted to the north. In time, a second manufacturing center of this type may develop at Shanghai, dependent on cheap transportation for the assembling of bulk raw materials and shipping of finished products, cheap electric power, skilled labor, and continued market attractions. But in the current acute capital shortage in China, which is unlikely to be alleviated soon, such a development cannot be considered imminent.

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505 not only depended heavily on seaborne supplies, but which had a
439 large and important transit-trade.

As if in a commentary on the nature of the city's food supply,
433 food, in particular rice, has remained cheap and plentiful throughout the period of Communist control. Order was quickly restored in the delta in 1949, and the flow of low-cost food to the city was maintained despite a nearly universal food shortage or famine in the rest of China during the winter of 1949–50, and despite the Nationalist blockade, which prevented any substantial amounts of food from arriving in the city by sea. The Communist Government has apparently been able to solve, at least to a degree, the problem of local rice supply during the planting season and at festival periods, by controlling prices and arranging for large government purchases which are released on the market at stable prices whenever the situation requires. There is no suggestion that local food supplies are not entirely adequate to meet the city's demands under such a
[162] system of management. While no official figures have been released, it is unlikely that Shanghai's population is substantially less than the four millions it had reached in 1936; it may have risen closer to the five million mark, since the great influx of people after the Japanese war has not apparently been balanced by the still limited exodus.*

288 Nationalist bombings during the winter of 1949–50 did only minor industrial damage, and came to an end by late 1950 with the arrival of jet defense planes from the Soviet Union and the Nationalist loss of the Chusan Islands, which had been the major base for the bombings of the city. A continuing deterrent to industrial recovery however has been the still inadequate domestic production of raw cotton. Several cotton textile factories in the city were obliged to shut down entirely during 1949 and 1950 for lack of raw cotton, and while all or most of these have subsequently reopened, not enough cotton is coming in to maintain peak production.†

poor position, and its economy has in the past been closely geared with that of the West.

* See above, p. 21. Foreign and Chinese press reports still consistently refer to Shanghai as the fourth largest city in the world, with a population given variously as 5 or 6 million.

† *Hsin-Hua Yüeh-Pao* for November 1951, 130–131, reports that while production

2: Murphy G-4 (no date) 1953 AF15 East China AF15



Cotton production is gradually increasing, and the expectation is that within the next two or three years enough will be available domestically (mainly in the delta area) to occupy Shanghai's full textile potential, which is still the largest of any city in the country.

Much shuffling around of the industrial pattern has resulted from government regulations on the types of manufacturing which may be licensed and may obtain the necessary power and supplies. During 1950 nearly 500 "factories" closed down, through financial failure and through inability to obtain licenses because they were considered non-essential under the new regulations. Most of the casualties were presumably small-scale manufacturers operating in private houses, who were before the war engaged in a great variety of production, mostly of consumers' goods. Many of these have since reopened, but in different production lines more in keeping with the government's new policy, and for which a market is available under the current austerity program. The government has for example refused reopening licenses to tobacco manufacturers, restaurants, hotels, and funeral establishments.[5]

The problem most frequently referred to in Chinese reports on economic Shanghai since 1949 is that of keeping pace with increased rural demand and rural purchasing power. This may be designed as an advertisement of the accomplishments of the land reform program in raising rural living standards, but it is repeatedly stated that industrial production in the city runs behind the demand in the country. Industries in the city showing the greatest profits during this period have been those producing light consumers' goods for which there is a ready local market. Dyeing leads the list, since the delta peasants are now sufficiently well off, if one may take the published reports at face value, to buy colored and printed clothing made in Shanghai. Western-type medical supplies are also listed, which would indicate a revolution indeed in the *mores* and income of the Chinese peasant. One report gives as an example of increased

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of cotton textiles for China as a whole in 1950 and in the first six months of 1951 was between 20 and 30 per cent greater than the pre-1937 peak, domestic production of raw cotton is still inadequte to meet the demands of the textile industry. For an earlier post-war report, see Shen Wen-fu, The Increase in Cotton Production, (1948).

3: Hinder G-5 (1933-1942) 1944 AF15 East China AF15



new enterprises in a manner vastly different from that in which the first industrial efforts had been embarked upon. The Division took full advantage of the opportunity thus presented to co-operate with the more modern-minded Chinese industrialists. Every correct installation, every new advance in standards of excellence represented an achievement which, as time went on, others in the same field could be challenged to imitate. In consequence the Settlement industrial scene by the time Pacific hostilities broke out in December 1941 was, in part, one in which newer ideas and concepts had begun to prevail.

A conspicuous example was in the silk reeling industry. Prior to the outbreak of the 1937 hostilities, the Division had used its influence to obtain the closure of several of the older filatures in the Settlement. Many filatures were owned, not by those who reeled the silk, but by property owners who had installed crude reeling machinery and let the premises season by season to men in the reeling business. It was small wonder that the conditions were appalling. A depression in 1935 helped to convince the owners of old plants that the time had arrived to put their land to better use, and demolition of several filatures followed.

Thus at the outbreak of the 1937 hostilities there were only two silk filatures in the Settlement. New filatures had been built instead in nearby provincial cities, where there is less general congestion because land is cheaper. Skilled reelers no longer left their cities to come to Shanghai for the reeling season. But when hostilities spread into the hinterland of Shanghai, and the city became one of the few places where Chinese-owned industry might operate freely, there sprang up in 1938 no fewer than 46 steam silk filatures. The reeling of silk from cocoons demands in the first instance the freeing of the filament by boiling in water, and cocoons have to be soaked continuously in very hot water during the whole of the reeling. Old-type silk filatures contained long double rows of basins. In one row, where the water was kept actually at boiling point through steam pressure, small children beat cocoons so as to free the filament; and at the other sat women, handling extremely fine threads usually reeling from five cocoons to produce one thread of reeled silk. Tiny children stood for an eleven-hour day, soaked to the skin in a steamy atmosphere hot

3: Hinder G-3 (1933-1942) 1944 AF15 East China AF15



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even in winter, their fingers blanched to the knuckles and their little bodies swaying from one tired foot to the other, kept at their task by a stern overseer who did not hesitate to beat those whose attention wandered.

The erection of many new filatures was the occasion to insist on a reform which had two objectives. Owners were required to install a "central boiling system," apparatus outside the workroom where cocoons were boiled. As a result, cocoons did not need to be beaten by children in actually boiling water, and cocoons needed beating less long. Though children still were used, there was some mitigation in the conditions of their work. In every one of the 46 steam silk filatures which commenced operations, success in obtaining installation of a central boiling system was achieved. And this reform was accomplished, not through legal compulsion, but through the influence of a Chinese woman factory inspector who was respected in the silk trade for technical knowledge previously gained in a Wusih filature.[9] She had reformed the operations of that filature in several ways, thereby influencing the entire silk trade in Wusih. And when hostilities drove them to Shanghai, Wusih owners and others were willing to take her direction and advice.

A second advance was made in the installation of more modern machinery known as the "slow reeling system," which dispenses with the necessity for beating the cocoons after boiling. As a result, no children need be employed. Two filatures installed this type of machinery. One, the most modern and best managed, was owned and operated by a Chinese woman. Other filatures were persuaded to experiment in the installation of a mechanical stirrer, which also had the effect of eliminating the work of children. Models of a mechanical stirrer were developed with the encouragement of Council officials by one of the new machine shops equipping the majority of the new filatures, three of which installed the device. Production was found to be improved thereby in one instance.

[9] Before the outbreak of hostilities, Wusih, a city some 70 miles distant from Shanghai, was an important industrial centre where all enterprise was Chinese-owned and operated. Flour and cotton mills and silk filatures represented the most important industries. Located in a sericultural area, with a supply of soft water particularly suitable to the reeling process, Wusih was well situated to be a silk reeling centre. The earliest modern silk filatures in China using the slow reeling process developed in Japan were in Wusih.

3: Hinder G-5 (1933-1942) 1944 AF15 East China AF15



The experiment could not be carried out to its logical conclusion, however, because after the spring of 1939, when the Japanese instituted controls over the cocoon output in the provinces, it became increasingly difficult to obtain cocoons from these areas. By the end of 1940 only two or three filatures were still operating, and the spring of 1941 saw very few cocoons reaching Shanghai.

DESPITE THE LACK of legal powers, it proved possible radically to reform the manufacture and operation of steam pressure vessels. Prior to 1936, when the institution of controls began, local boiler yards manufactured boilers almost exclusively from metal plate of unknown quality and test, and from designs which did not conform to accepted standards. Neither owners nor workers in the boiler yards had the necessary knowledge for an engineering task requiring special training. The result was that hundreds of initially unsatisfactory boilers had been installed. Regular inspection of them was unknown. Explosions were frequent, at times accompanied by loss of life; and the wonder was that they did not occur almost every day.

In 1936 the Council adopted rules governing vessels and systems under pressure, and for the registration of boiler yards. By the rules all local boiler yards had to employ the services of a Council-approved boiler surveyor who would design and supervise the construction of all vessels. Boilers had to be inspected and registered. Thereafter annual re-inspection was required. A roster of qualified engineers of all nationalities was obtained with the assistance of a specially appointed Boiler Board.

Although the regulations carried no penalty clause, it proved possible to apply them to a very considerable extent. All of the 34 boiler yards in the Settlement were registered, and no boiler after 1936 was manufactured or extensively repaired in them unless a permit therefor had previously been obtained. Qualified boiler surveyors supervised the construction and repair, and submitted copies of certificates describing the metal plate used. Considering the steep rise in the price of imported steel during those years, a result of higher world prices and the lower exchange value of the Chinese dollar, it is noteworthy that tested steel became universally used in pressure vessels manufactured in the Settlement.